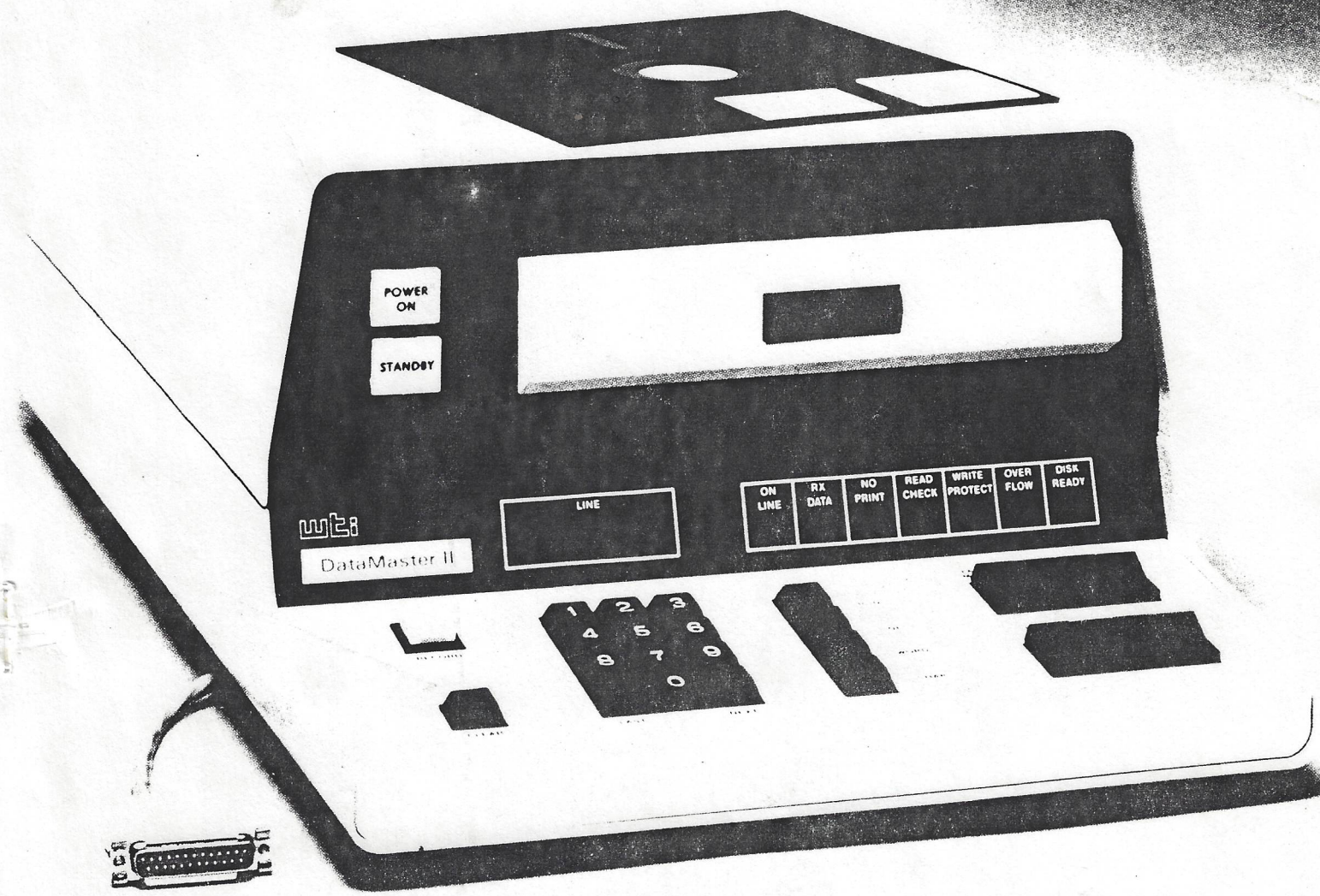
OPERATOR'S MANUAL

DataMaster II



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PREFACE

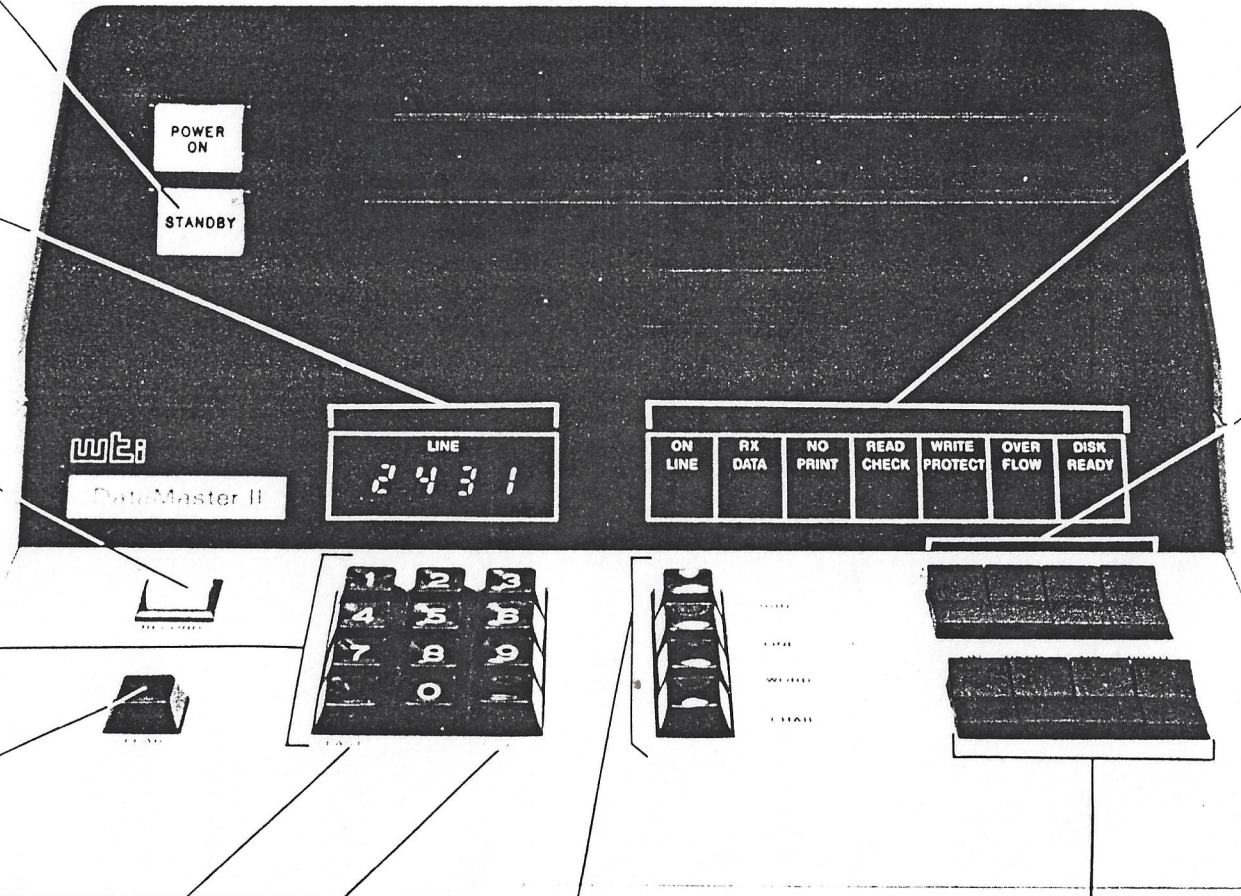
This handbook is intended for operators of the DATAMASTER II, flexible disk I/O data recorder and edit system. This handbook provides, to the unfamiliar operator, step by step training from basic to advanced use of the DATAMASTER II. For the advanced operator the organization and examples provide reference helps in many applications.

The appendices provide additional helps in installation, what to do if problems occur and technical data.

CONTENTS

Press STANDBY to turn off disk mode and hold DataMaster transparent to communications between terminal and modem.

Set BAUD RATE to select either of two pre-selected baud rates.



Control Status indicators.

Set PACK to permit the recording of continuous data. Permits utilizing all memory locations.

Set TRANSPARENT to ignore ASC control codes. Especially valuable for handling plot and other graphic data. Also allows backspace key to cause an underscore.

Set OPTION key to enable selected optional functions.

Set AUTO LF key to enable DMII to issue a line feed code automatically.

Press to RECORD.

Numeric keypad to select desired line number.

Reset button.

Decrement to next lower line number.

Increment to next higher line number.

"PLAY" keys

Press RUN to transmit data. Transmission continues until a stop code is detected. *

Press LINE to transmit data located at displayed line number. *

Press WORD to transmit next word. *

Press CHAR to transmit next character. *

* function also controlled by remote control code.

Set ON LINE to allow unit to communicate with modem.

Set OFF to permit communication between DataMaster and terminal only, but holding control lines to modem. Edit while retaining computer connection.

Set SKIP DATA key to skip those lines preceeded by a skip code.

Set NO PRINT (full duplex) to disable local print out.

Set PRINT ID to allow the line ID number to be printed prior to the data being recorded or printed. Eliminates guessing as to where data is stored.

SECTION ONE

INTRODUCTION

The DATAMASTER II is a random access data storage medium providing additional flexibility to any RS232 compatible terminal.

Some of the features are:

- Removable Flexible Disk.
- Over 311,000 Characters of Storage.
- RS232 Compatible Interface.
- Fast Random Access.
- Easy To Use Text Edit System.
- Quick Search Capability.
- Control of DATAMASTER II by:

    Unit's Own Keyboard
    Terminal Keyboard
    Remote Processor

The DATAMASTER II uses the inexpensive and highly reliable flexible disk organized as 2,431 addressable records of up to 128 characters each.

The DATAMASTER II is intended for plug compatible attachment between existing ASCII printer/display terminals and their RS232 modem.

Access time to any line or record averages 0.4 seconds.

File updating is as simple as replacing punched cards. Data can be deleted, added or inserted at any line location without rearranging text. A recordable GO TO or LINK command allows a file jump under internal or program control to random file locations. Backspace Erase combined with SINGLE KEY control for release of characters, words or line, supply the flexibility required for easy text modification.

A SEARCH of up to 128 characters is performed at the rate of 100 lines per second.

SECTION TWO

BASIC OPERATIONS

2.1 DISK LOADING AND UNLOADING

Proper loading of the flexible disk is vital to the operation of the disk drive. The disk drive is equipped with positive locking to help prevent damage to the cartridge while loading. With the door open, insert the disk with the elongated cut-out end going in first and the envelope foldover down. Push the disk into the unit until it disengages the protective stop. Move the handle down until it "clicks" shut. The DISK READY indicator will signal that the disk is properly loaded and rotating. The disk may be loaded or unloaded at any time during normal operation without damage. However, to insure that all functions being performed on the DMII are successfully completed, the disk should not be unloaded until the DMII operation is completed. THE POWER TO THE DMII SHOULD NOT BE TURNED OFF WHILE THE DISK IS LOADED.

2.2 WRITE PROTECT

Data recorded on a flexible disk may be protected by using the WRITE PROTECT feature. If the disk is intended to be used for Read Only, verify that the WRITE PROTECT hole in Figure 1 is open. To enable data recording, the hole must be covered with opaque tape.

2.3 DISK HANDLING

- Do not write on the flexible disk jacket or envelope with a lead pencil or ball point pen. Use a felt tip pen or prepare a label with appropriate information and then apply to the envelope.

- As strong magnetic fields may destroy data, keep the flexible disk away from magnetic fields and ferro-magnetic materials.

- Do not allow foreign materials to fall on the flexible disk as disk and head contamination can occur.

- Do not expose disk to heat or direct sunlight.

- Do not touch or attempt to clean flexible disk surface.

- Do not power down the DMII with the disk loaded as recorded data may be destroyed.

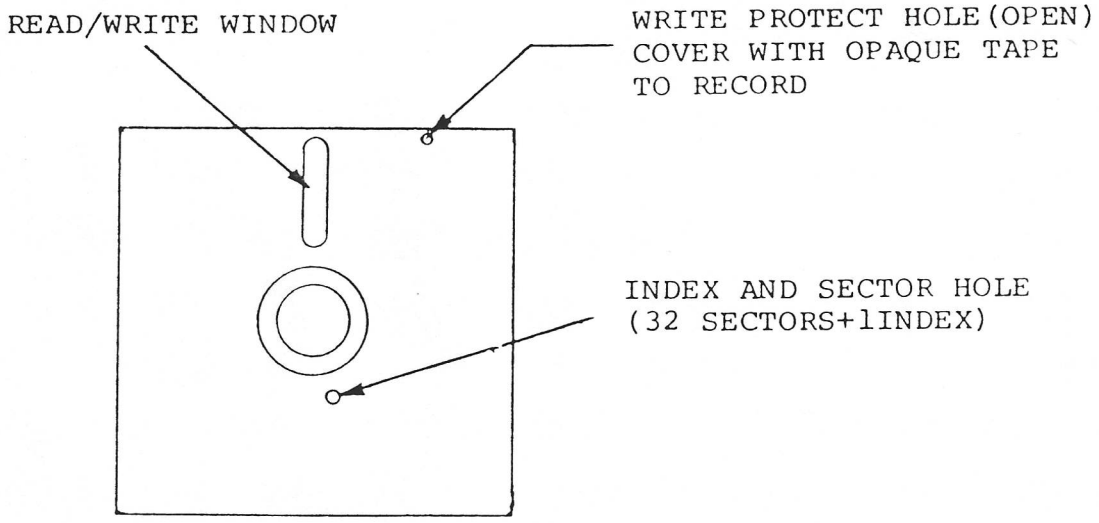


FIGURE 1

DISK CARTRIDGE

CAUTION: Power should NOT be turned OFF while disk is loaded.

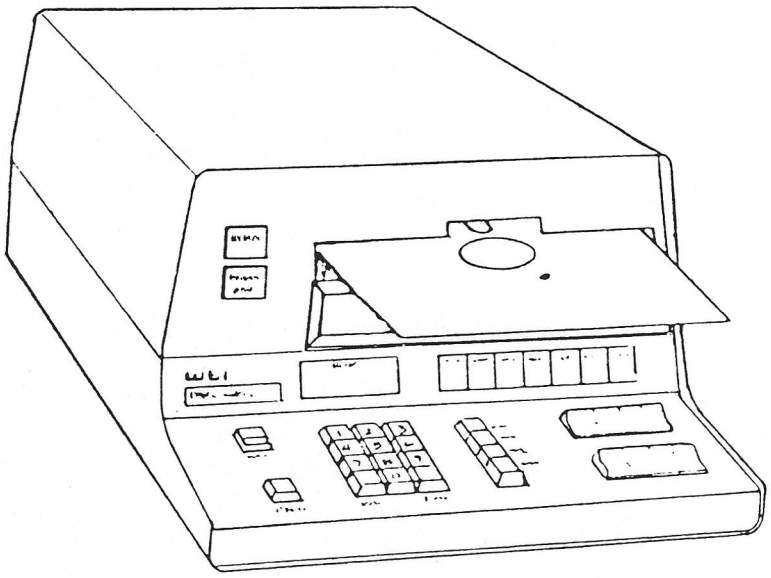


FIGURE 2

DISK INSERTION

2.4 OPERATING CHECK LIST

1. Turn the Power switch of the Data Terminal ON.

2. Put the Data Terminal in the ON-LINE mode.

3. Turn the Power switch of the DATAMASTER II (DM II) ON.

   The DMII is turned ON by pressing the POWER ON button located in the upper left hand corner of the DM II.

4. Place all rocker switches on the right hand side of the DM II in the OFF or DOWN position.

5. Insert the flexible disk per disk loading instructions.

6. The DISK READY light will go on.

7. From the Data Terminal keyboard test to assure that connections between the Data Terminal and DM II are correct.

   Press the Control key on the Data Terminal and at the same time press the "R" key followed by the "T" key. This exercise should turn ON and OFF the RECORD light on the DM II.

2.5 RECORD A LINE

THE FOLLOWING SIMPLE EXERCISES TEACH THE BASIC FUNCTIONS OF THE DM II.

1. Press the CLEAR key. The LINE number light will read Ø.

2. Press the RECORD key. The RECORD key will illuminate indicating data can be recorded by the DM II.

3. From the terminal keyboard, type "It is easy to record on the DM II."

4. Press the carriage return key, CR.

5. Press the LINE FEED key, LF.

   The carriage return/line feed (CR/LF) tells the DM II that a line has been ended. The LINE number will advance to 1. The line entered has been recorded on line Ø.

6. Press the RECORD key. The RECORD key light will go out, indicating that no more data is to be recorded.

You have successfully recorded data on the DMII.

2.6 PLAY BACK

The play keys are located in the center of the DM II keyboard and are used to output that data which is recorded.

1. Press the CLEAR key. The line number display will reset to zero.

2. Press the LINE play key & "It is easy to record on the DMII" will be printed on your terminal.

   The LINE play key displays or prints one line of recorded information. A line is defined as data between carriage return/line feed codes.

3. Press the CLEAR key. The line number display will reset to zero.

4. Press the WORD play key.

   The first recorded word "IT" will be printed. Press the WORD key again and the second recorded word "IS" will be printed. Continue to press the WORD play key for additional words in the line. A word is defined as data between spaces.

5. Press the CLEAR key. The line number display will reset to zero.

6. Press the CHAR play key.

   The first recorded character will be printed. Press the CHAR play key again and the second recorded character will be printed. Continue to press the CHAR play key for additional characters.

The play keys allow the operator to print a character, word or complete line recorded on the DM II.

2.7 STOP CODES

A Stop Code must be used when ending your work to prevent overrunning into previously recorded data when playing back.

1. Press CLEAR key. The line number display will reset to zero.

2. Press RECORD key. The RECORD key will illuminate.

3. From the terminal keyboard type:

"When a file is completed it is necessary to CR/LF
terminate the data with a Stop Code. This prevents CR/LF
overrunning into the next file of data on play back. CR/LF
+S CR/LF *

4. Press RECORD key. Record key light will go out and recording will end.

5. Press CLEAR key. The line number display will reset to zero.

6. Press the RUN play key. The text typed in will be printed back.

*+S = CONTROL S. The Control S is entered from the Data Terminal by holding down the control key while pressing the "S" key. The plus (+) character will represent the control key and all control functions are performed in the same manner.

2.8 PRINTING LINE NUMBERS

The PRINT ID switch, when selected, signals the DM II to print the line number plus two spaces prior to printing out the contents found recorded on the line.

1. Turn the PRINT ID switch ON. The switch is located in the lower right hand corner of the DM II.

2. Press the CLEAR key.

3. Press the RUN key. The text entered in the Stop Code exercise will be typed with line numbers:

```
0000  When a file is completed it is necessary to
0001  terminate the data with a Stop Code. This prevents
0002  overrunning into the next file of data on play back.
0003
```

4. Turn OFF the PRINT ID switch.

2.9 LINE ADDRESSING AND ACCESS

The DMII can be thought of as a box of 2431 punched cards, each capable of holding 128 characters of data. Each "card" or line can be randomly accessed or sequenced one at a time, forward or backward. The calculator type key pad will allow you to access any line on the disk, Ø-2431. The LAST and NEXT key will sequence the line up or down, one line at a time.

1. Enter line "500" from the key pad. The LINE number will read 500.

2. Press the RECORD key.

3. From the terminal keyboard type:

   This is line 500. CR/LF

   The LINE number will read 501.

4. Press the RECORD key.

5. Press the LAST key.

   The LAST key is located in the lower left corner of the calculator type keyboard. The LINE number will read 500.

6. Press the LINE key.

   "This is line 500." will print.

7. Turn the PRINT ID switch on.

8. Enter "2" on the DM II calculator keyboard.

9. Press the LINE key.

   "0002 overrunning into the next file of data on play back."

   is printed.

10. Turn PRINT ID off. You have now skipped from one recorded line to another recorded line.

The PRINT ID feature is useful when typing a rough draft. It allows the operator to reference the line number of each line which makes data editing much simpler. This eliminates counting lines or playing the data back to get a listing.

SECTION THREE

EDITING

Data recorded on the DM II is recorded on a disk. Editing, modifying or transmitting requires that the line of data to be edited, modified or transmitted be moved from the disk to a special work area called a working buffer. After data in this working buffer is edited or modified, the line must be re-recorded on the disk. Text Modification, 3.2, describes this operation.

The exercises for editing will be in a more advanced format.

3.1 BACKSPACE EDIT (BKSP EDIT)

The BKSP EDIT feature allows the backspace key of the terminal to erase characters when the DM II is in the RECORD mode. When backspacing more than one character, retype all the characters backed over. Do not space forward, type forward.

Note: The DMII is always in the BKSP EDIT mode. To use the backspace code as an underscore, set the TRANSPARENT KEY in the ON position.

1. CLEAR
2. RECORD (ON)
3. Enter — The backspace fet
4. Backspace
5. Enter — ature saves time.CR/LF
6. RECORD (OFF)
7. LAST
8. LINE — The backspace feature saves time.

At Step 4 the backspace key on the Data Terminal is used to backspace one character, at Step 7 the LINE number is decremented, so in Step 8 the line entered can be played back with no spelling error.

Note: When recording in the ON-LINE mode, the BKSP EDIT feature is disabled.

3.2 TEXT MODIFICATION

Characters in a recorded line may be modified by playing out data to the desired position using the WORD and CHAR keys, then going into RECORD, modifying the data and then going out of RECORD. This procedure modifies the data in the working buffer. To transfer the edited data back

onto the disk requires an edit-complete operation which can be accomplished four different ways:

1. Entering CR/LF while in the RECORD mode. This method re-records the data up to the CR/LF.

2. Pressing the LINE play key while NOT in the RECORD mode. This method re-records the complete line.

3. Entering CR/LF while NOT in the RECORD mode. This method re-records the complete line.

4. Pressing the LINE play key while in the RECORD mode. This method re-records the complete line.

NOTE: If an edited line of data is not terminated by an edit-complete operation the edited data will not be re-recorded.

3.2.1 SHORTEN A LINE

1. CLEAR
2. RECORD (ON)
3. Enter Lines may be shortened or lengthened.CR/LF
4. RECORD (OFF)
5. WORD Lines may be shortened
6. RECORD (ON)
7. Enter .CR/LF
8. RECORD (OFF)
9. LAST
10. LINE Lines may be shortened.

In Step 5 play the words out using the WORD play key to the last word of the shortened sentence.

3.2.2 EXPAND A LINE

1. CLEAR
2. RECORD (ON)
3. Enter A line may be expanded.CR/LF
4. RECORD (OFF)
5. LAST
6. WORD A line may be
7. CHAR expanded
8. RECORD (ON)
9. Enter to 128 characters.CR/LF
10. RECORD (OFF)
11. LAST
12. LINE A line may be expanded to 128 characters.

The recorded line is played out a word at a time in Step 6. Step 7 plays the word "expanded" character by character to the point where the expansion of the line takes place.

3.2.3 CORRECT A WORD

```
 1.  CLEAR
 2.  RECORD (ON)
 3.  Enter      It's easy ta correct a word.CR/LF
 4.  RECORD (OFF)
 5.  LAST
 6.  WORD       It's easy
 7.  CHAR                 t
 8.  RECORD (ON)
 9.  Enter                 o
10.  LINE                    correct a word.
11.  LAST
12.  LINE       It's easy to correct a word.
```

Note in Step 10 that the LINE key automatically turns off the RECORD.

3.2.4 DELETE CHARACTERS

ⓓ = DELETE KEY on Data Terminal or non-printing characters on Data Terminal.

```
 1.  CLEAR
 2.  RECORD (ON)
 3.  Enter      Delete words by nnon printing control codes.CR/LF
 4.  RECORD (OFF)
 5.  LAST
 6.  WORD       Delete
 7.  RECORD (ON)
 8.  Enter             text ⓓ
 9.  WORD                   by
10.  RECORD (ON)
11.  Enter                   ⓓ
12.  WORD                     non printing
13.  RECORD (ON)                          ⓓⓓⓓⓓⓓⓓ
14.  LINE                                          codes.
15.  LAST
16.  LINE       Delete text by non printing codes.
```

In Step 8 the word "words" was changed to "text" and the "s" of words was deleted. In Step 11 the misspelling was corrected and in Step 13 the word "control" was deleted.

3.2.5 EDITING THE FIRST CHARACTER OF A LINE

Editing the first character of a line may be accomplished two different ways:

1. If the PRINT ID switch is OFF, press the CHAR key to move the data from the disk to the working buffer and print the first character. With RECORD ON, backspace and enter desired data. (SEE EXAMPLE 1)

2. With PRINT ID ON, press the CHAR key once. The working buffer now contains the line from the disk, but the first character is not printed. Turn RECORD ON and enter the desired data. (SEE EXAMPLE 2)

EXAMPLE #1

```
 1.  CLEAR
 2.  RECORD (ON)
 3.  Enter      how to correct the first character of a line.CR/LF
 4.  RECORD (OFF)
 5.  LAST
 6.  CHAR       h
 7.  RECORD (ON)
 8.  Backspace
 9.  Enter      H
10.  LINE        ow to correct the first character of a line.
11.  LAST
12.  LINE       How to correct the first character of a line.
```

EXAMPLE #2

```
 1.  CLEAR
 2.  RECORD (ON)
 3.  Enter      how to correct the first character of a line.CR/LF
 4.  RECORD (OFF)
 5.  PRINT ID (ON)
 6.  LAST
 7.  CHAR  ØØØØ
           The line number is printed and the line on the
           disk is transferred to the working buffer.
 8.  RECORD (ON)
 9.  Enter      H
10.  LINE        ow to correct the first character of a line.
11.  LAST
12.  LINE  ØØØØ  How to correct the first character of a line.
```

3.2.6 WORD INSERTION

An Insert Code +N (+ = Control) allows data to be inserted in a line without re-entering the remainder of the line.

The Insert Code sets the DM II into RECORD. Data may now be entered. When RECORD is turned off the line will be expanded on the disk and a CR/LF will be sent from the DM II. The line may then be played back for further editing. The line may be expanded to the maximum 128 characters. If data is inserted which makes the total character count greater than 128, the overage will be deleted.

```
 1.  CLEAR
 2.  RECORD (ON)
 3.  Enter      Expanding thru insert feature.CR/LF
 4.  RECORD (OFF)
 5.  LAST
 6.  WORD       Expanding thru
 7.  +N
 8.  Enter                          the
 9.  RECORD (OFF)
10.  LINE       Expanding thru the insert feature.
```

3.2.7 REVERSE INSERT

Just as the +N allows data to be entered and the line expands to accomodate that which is entered, +N can be used to delete, with the backspace key, and remove and compress the line.

```
 1.  CLEAR
 2.  RECORD (ON)
 3.  Enter    Reverse insert is not difficult on the DATAMASTER.CR/LF
 4.  RECORD
 5.  LAST
 6.  WORD     Reverse insert is not
 7.  CHAR                              difficult
 8.  +N
 9.  Backspace                  <<<<<<<<<<<<<<<<
10.  RECORD (OFF)
11.  LINE     Reverse insert on the DATAMASTER.
```

3.2.8 REVERSE INSERT AND ADDING OF DATA

Data may also be added after backspacing. Using the example in 3.2.7, instead of line 10 turning record OFF, the following example could be used:

```
10.  Enter                    is easy
11.  RECORD (OFF)
12.  LINE    Reverse insert is easy on the DATAMASTER.
```

3.2.9 ERASE A LINE

In the RECORD mode, a BACKSPACE in the first character of the working buffer will erase all data on that line and advance to the next line. Use the repeat key to erase multiple lines.

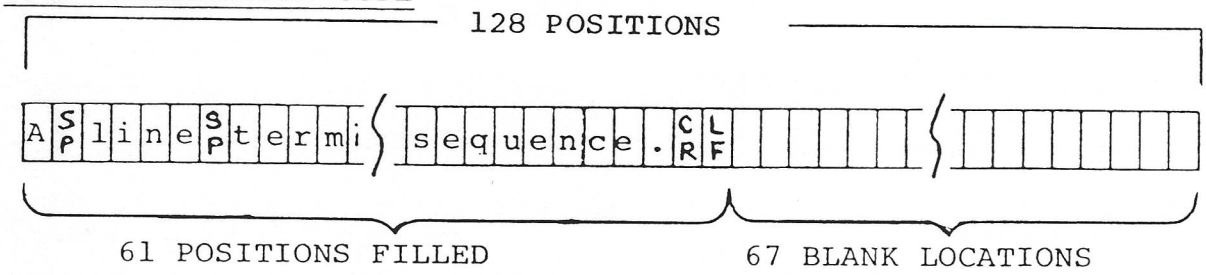
SECTION FOUR

ADVANCED OPERATIONS

4.1 LINE TERMINATION AND DATA FORMAT

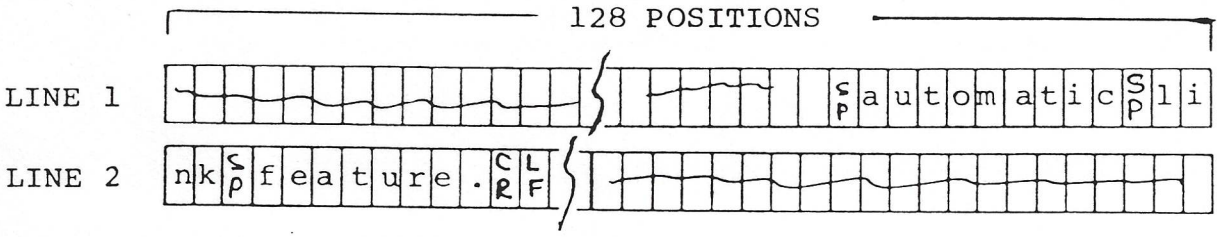
The DATAMASTER DMII is capable of recording 2431 records or lines. Each line recorded on the DM II may contain 128 printing or non-printing characters. Data is transferred from the working buffer or memory to the disk and the line number counter advances when a line termination code is detected. Automatic linking to the next line will occur when 128 characters have been received.

4.1.1 LINE TERMINATION CODE



A line terminates on a carriage return, line feed sequence. (CR/LF)

4.1.2 AUTOMATIC LINKING



RESULTS DURING PLAYBACK . . . . automatic link feature.

Recording multiple lines of data on one disk line can be accomplished by a LF/CR, instead of a CR/LF sequence which advances the disk line number.

4.1.3 RECORDING AN ADDRESS ON ONE DISK RECORD

1. CLEAR
2. RECORD (ON)
3. Enter

```
Western Telematic  LF,CR
2435 Anne Street   LF,CR
Santa Ana, CA  92704  CR,LF
```

4. RECORD (OFF)
5. LAST
6. LINE

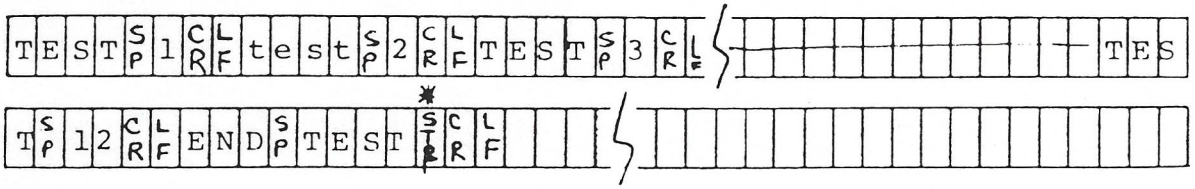
Western Telematic
2435 Anne Street
Santa Ana, CA 92704

NOTE: 61 character positions of one disk line have been used with 67 characters available for editing.

4.2 PACK MODE

When the PACK MODE is selected, the line counter will not advance when a line termination code is detected. The line number will advance when the working buffer or memory has received 128 characters. This allows for the utilization of all memory positions for maximum data storage.

When recording data in the PACK MODE, it should be remembered that the last character of text may end somewhere between the 1st and 128th character of the working buffer, thus not transferring or recording on the disk. The last line may be transferred onto the disk by entering a +S, Stop Code or by switching out of the PACK MODE and entering a +S, Stop Code followed by a CR/LF.



4.3 LINE INSERTION AND DELETION

By using the recordable GO TO feature (+A followed by a line number and CR/LF), lines and paragraphs of data may be skipped over, inserted or repeated to allow for ease in rearranging text. With the PRINT ID switch ON, the line number and data following the +A will be printed to help identify the GO TO address.

4.3.1 LINE DELETION

With the PRINT ID switch ON, record the following beginning at line 1000.

```
1000  Switch    2862   C&K
1001  Cord      1286   Belden
1002  Lamp      330    Oshino
```

Delete data on line 1001.

1. Access line 1001.
2. RECORD (ON)
3. Enter +A 1002 CR/LF
4. RECORD (OFF)
5. Access line 1000
6. RUN

```
1000  Switch    2862   C&K
1001  1002
1002  Lamp      330    Oshino
```

7. Access line 1000
8. PRINT ID (OFF)
9. RUN

```
Switch    2862    C&K
Lamp      330     Oshino
```

4.3.2 LINE INSERTION

With the PRINT ID switch ON, record the following starting at line 100.

```
0100  Bumper    10020  1
0101  Pump      10024  1
0102  Gasket    10025  1
```

Insert 3 lines between lines 100 and 101.

1. Access line 101.
2. RECORD (ON)
3. Enter +A 500 CR/LF
4. RECORD (OFF)
5. Access line 500.
6. RECORD (ON)
7. Enter

```
0500  Bolt      10021  4
0501  Nut       10022  4
0502  Washer    10023  4
0503  Pump      10024  1
0504  +A 102  CR/LF
```

8. RECORD (OFF)
9. Access line 100.
10. PRINT ID (OFF)
11. RUN

```
Bumper    10020  1
Bolt      10021  4
Nut       10022  4
Washer    10023  4
Pump      10024  1
Gasket    10025  1
```

The insertion of a line required that line 101 be used as the GO TO (+A) line and had to be re-entered as part of the line insertion.

4.3.3 LINK LINES TOGETHER

```
0010 . . . and therefore we propose a bid of  +A  1200  CR/LF

1200  $5,600 which is itemized as follows:
1201  LF,CR/LF
1202                PARTS     $2,500
1203                LABOR     $3,100
```

With the PRINT ID off the letter would read:

. . . and therefore we propose a bid of $5,600 which is itemized as follows:

```
                    PARTS     $2,500
                    LABOR     $3,100
```

NOTE: By changing the line number of the GO TO (+A), the user could jump to another set of statistics.

4.3.4 GO TO AS A REPEAT CODE

Record the following letter using a stop and repeat code.

```
0600   +S  LF LF LF CR/LF
0601  Dear Mr.  +S  LF CR/LF
0602  Thank you for your contribution of  +S  CR/LF
0603  towards the building of our new library.  CR/LF
0604  Your support of this worthwhile project is CR/LF
0605  greatly appreciated.  CR/LF
0606  LF LF  Sincerely, CR/LF
0607  LF LF LF LF LF LF LF LF CR/LF
0608   +A  600 CR/LF
```

1. PRINT ID (OFF)
2. Access line 600.
3. RUN
4. RUN

Dear Mr. Smith ← (Type in) →

Thank you for your contribution of $25.00
towards the building of our new library.
Your support of this worthwhile project is
greatly appreciated.

Sincerely,

5. RUN (To restart the letter after inserting paper.)

Step 3 will print the Dear Mr. and stop so "Smith" can be typed in. Step 4 prints until the amount is to be entered.

4.3.5 SEARCH

The SEARCH feature allows data entered into the working buffer memory to be compared with data recorded on the disk. Up to 128 characters may be used as the search variable with no regard as to upper or lower case alpha characters. When an equal compare occurs the entire line may be printed.

The SEARCH mode is entered by entering +B on the terminal, the desired search variable and one DEL character. The SEARCH is executed by pressing a play key or the record button on the DM II or corresponding code keys on the terminal.

Search for SINCERELY as entered in 4.3.4:

1. CLEAR
2. Enter +B Sincerely ⓓ
3. LINE

When the data is found, the DM II will issue a CR/LF, the terminal will advance a line and the recorded line in which "Sincerely" is located will be printed.

If the RUN key is used to execute the search, data will be printed until a stop code is detected or manual intervention occurs.

The SEARCH may be initiated from any LINE number, but to start the SEARCH from any number greater than zero you must first enter the line number and either access it by pressing LINE or pushing RECORD ON-OFF, then entering the SEARCH command.

When a SEARCH goes into OVERFLOW condition, the OVERFLOW indicator light will illuminate.

An option, MultiSearch, is available which enables the DMII to search for every occurrence of the search variable.

SEE APPENDIX A - OPTIONS

4.3.6 REMOTE ACCESS

Line access, play keys and record functions of the DM II can be controlled by the terminal keyboard.

These functions are controlled by control characters on the terminal and a full list of these are found in Appendix B of this manual.

Using the exercise of 4.3.4, record the letter using the terminal keyboard Remote Access Control Codes.

1. Enter +A 600 CR/LF
2. Enter +R (+R turns RECORD on)
3. Enter +S LF LF LF CR/LF
4. Dear Mr. +S LF CR/LF
5. Complete the letter
6. Enter +T (+T turns RECORD off)
7. Enter +A 600 CR/LF
8. Enter +Q (+Q is equivalent to the RUN play key)

SECTION FIVE

DUAL DRIVE MODEL OPERATIONS

Because of an additional disk drive, the Dual Drive model can perform certain functions that cannot be performed on the DMII Single Drive model. In addition, there are other controls and indicators on the Dual Drive model that are necessary in order to be able to perform these other functions. This section will deal with the additional functions, controls, and indicators as they pertain to the Dual Drive model but is not intended to be all inclusive as far as applications are concerned.

5.1 GO TO COMMAND

A control A (GO TO Command) followed by the letter "A" or "B", the line address, and a CR/LF will cause the Data-Master to access the line address on disk "A" or "B" respectively. A control A (GO TO Command) followed by just the line address will cause the Datamaster to access the line address of the disk currently being used. These rules apply to commands received from the Data Terminal and those recorded on the disk.

EXAMPLE: Print a block of data on disk A. On command, GO TO disk B, print data, then go back to disk A.

~~ CR/LF	Text recorded on lines 0 thru 2
~~ CR/LF	of disk A.
~~ CR/LF	
Control A, B, 1000 CR/LF	Go to disk B, line 1000
~~ CR/LF	Text recorded on lines 1000
~~ CR/LF	thru 1002 of disk B.
~~ CR/LF	
Control A, A, 12 CR/LF	Go to disk A, line 12
~~ CR/LF	Text recorded on line 12 of disk A.
etc.	

5.2 SWITCH CODE (Control U)

A control U (switch code) acts as a line termination and switches the Datamaster to the opposite disk. This is useful for merging data such as an address file with a form letter.

EXAMPLE: Merge mailing list addresses on disk B starting at line 0 with a form letter recorded on disk A starting at line 0.

DISK A	DISK B
LINE 0- AUGUST 12, 1977 LF/LF/CR CONTROL U	LINE 0- COPY CENTER LF/CR 2760 S. MAIN LF/CR LOS ANGELES, CA. 91074 LF/CR CONTROL U
LINE 1- TEXT OF LETTER CR/LF	LINE 1- SKY PARK EQUITIES LF/CR 1503 WESTHEIMER LF/CR HOUSTON, TEXAS 77005 LF/CR CONTROL U
LINE 2- TEXT OF LETTER CR/LF	LINE 2- etc.
LINE 3- TEXT OF LETTER CR/LF	
LINE 4- CONTROL A , 0 CR/LF	

MERGING OF ADDRESS AND LETTER

1. Set line display to 0.
2. Depress RUN
3. The date (AUGUST 12, 1977) prints and the control U (switch code) causes the DATAMASTER to switch to disk B, line 0.
4. The first address prints (COPY CENTER, etc.), and the control U causes the DATAMASTER to switch to disk A, line 1.
5. The text of the letter prints, and the GO TO command (control A) causes the DATAMASTER to return to line 0 of disk A.
6. The entire operation is repeated.

5.3 DISK DUPLICATION

A. Copy - With the DUP A switch on, data on disk A will be transferred to disk B. All 128 characters in the buffer are transferred before playing out to the terminal. This is to allow stop codes and other commands to be recorded on disk B.

B. HIGH SPEED DUP - With the DUP A switch and the OPTION switch on, data is transferred to the second disk at an accelerated rate of speed. An entire disk can be copied in approximately six (6) minutes. No printing occurs while using the high spped dup.

C. SELECTED DATA DUP - Using the MULTISEARCH option, all lines containing the searched for "variable" can be transferred to disk B.

EXAMPLE: Search all recorded addresses for the Zip Code 92683 and write those addresses on disk B.

1. DUP A and OPTION switches ON.

2. Enter CONTROL B, 92683, and push RUN.

D. SELECTED LINE DUP - Using this feature, data can be duped beginning at a specified line number.

EXAMPLE: Dup from lines 100 through 200 of disk A to lines 1000 through 1100 of disk B.

1. Dup A switch ON

2. Switch to disk B, enter line address 1000, press RECORD button on and then off. (sets disk B to address 1000)

3. Switch to disk A, enter line address 100, and press RUN.

E. SELECTED DATA AND LINE DUP

EXAMPLE: Search for a "VARIABLE" beginning at line 1000 on disk A and record the "VARIABLE" on disk B beginning at line 300.

1. Dup A & OPTION switches ON.

2. Switch to disk B, enter line address 300, press RECORD button on and then off.

3. Switch to disk A, enter line address 1000, press RECORD button on and then off.

4. Enter CONTROL B, the search variable and push RUN.

5.4 CONTROLS AND INDICATORS

The Dual Disk has the following controls and indicators in addition to those described in APPENDIX C of this manual.

A C POWER AND STANDBY

STANDBY DISK B — With the light on, places Disk B in standby mode and turns off the drive motor. Disk A may operate with Disk B off.

ROCKER SWITCHES

GO TO OFF — This switch disables the "Go To" command when playing back reformatted data copied form Disk A. This is necessary as data copied from Disk A may contain "Go To" commands to other lines on the disk. When copying this data to Disk B the data will be arranged in sequential order. When playing back Disk B the "Go To" command will still be present and must be ignored.

DISK B — When selected, all reading and writting is done through Disk B. The DATAMASTER Dual works as normal except the line number will not display until the RUN or RECORD command is issued and line numbers will not be printed out.

DUP A — Data is transferred from Disk A to Disk B.

OPTION MODE — Selects the AUTO ADDRESS feature of the DATAMASTER.

When selected with DUP A, causes a high speed duplication of Disk A to Disk B.

(Interactive)
When in the ON LINE Mode the Disk will stop after each CR and wait for an X-ON code from the computer

BACKPANEL SWITCHES

TRANSPARENT — (See TRANSPARENT under ROCKER SWITCHES in APPENDIX C.)

PACK — (See PACK under ROCKER SWITCHES in APPENDIX C.

APPENDIX A

DATAMASTER II OPTIONS

The DATAMASTER II is available with two options which greatly enhance its capabilities. These options are explained below with examples for easy understanding.

MULTISEARCH OPTION

Multisearch is an extension of the standard search feature. It provides the ability to search for and print every occurrence of the search variable on the disk at the rate of 13,000 characters per second. When the data being searched for is found and played out, the DMII will automatically start searching for the next occurrence on the disk. This will continue until all lines on the disk have been searched or manual intervention occurs.

EXAMPLE:

Data string to be searched for: Phoenix, Arizona

Data on disk:

John Doe 11212 Elm Street Phoenix, Arizona 49150
Al Granger 12904 Cook Rd. Phoenix, Arizona 49150
Nancee Smith 4914 Orange Ave Anaheim, Ca. 92704
Susan Hardman 7333 Bushard St. Dallas, Texas 76501
Dave Leonard 9639 Newfame Phoenix, Arizona 49160

Multisearch is executed as follows:

1. OPTION SWITCH ON
2. ENTER CONTROL B
3. ENTER PHOENIX, ARIZONA @
4. DEPRESS RUN

Results after multisearch:

John Doe 11212 Elm Street Phoenix, Arizona 49150

Al Granger 12904 Cook Rd. Phoenix, Arizona 49155

Dave Leonard 9639 Newfame Phoenix, Arizona 49160

AUTO ADDRESS OPTION

The AUTO ADDRESS option allows using the DATAMASTER II as a true word processing unit when used in conjunction with a letter quality printer. This feature allows a GO TO address or pointer to be incremented by a specific value and re-recorded to cause automatic sequencing of line numbers.

These special GO TO pointers can be used to sequence lists or addresses which would be recorded in various locations of the disk. The pointer would be part of a fixed format such as a letter, invoice, shipping order, etc., which would be stored in a "work area" of the disk.

The format of these special GO TO pointers is as follows:

CONTROL A, XXXX, SPACE(S) , CR/LF

CONTROL A- This is the normal GO TO code.

XXXX - Four (4) digit starting line number address of the file. All four digits must be entered. For example, line 625 would be entered as 0625.

SPACE(S) - The number of spaces entered is equal to the specific value the GO TO pointer is to be incremented by each time. For example, if you wanted every third name and address in a file to be used, the number of spaces entered would be three (3).

CR/LF - Carriage return and line feed code.

EXAMPLE 1: With an existing name and address file, send a personalized form letter to all those in the file. Name and address file starts at line 100 with each name and address using one (1) line on the disk. Form letter starts at line zero (0). Also print the names and addresses on envelopes. (See figure A-1)

OPERATIONAL PROCEDURE:

1. Check all switches on the DATAMASTER. Only the OPTION switch should be on.

2. Be sure the terminal is on line to the DMII and the correct Baud Rate is selected.

   (Do a communications test: send a Control "R". If the DATAMASTER Record light went on, the terminal and DATAMASTER are communicating. Push CLEAR. If the Record light did not go on check to see if the Baud Rate is set correctly.)

3. Select the line you wish to start your addresses. For this demonstration select line 100. Enter in 100 from the DATAMASTER 10 key pad. 100 should be shown on the line display of the DATAMASTER.

4. Go into Record mode. (Push the Record button on the DATAMASTER. When in Record mode, the Record button will be illuminated.

5. Now enter the address in the following manner:

   Mr. John Smith (LF,CR)
   1234 West A. Street (LF,CR)
   Los Angeles, Calif. 92660 (LF,CR,Control U, LF)

   Dear John, (LF,LF,CR,Control A,1,CR,LF)

   The line display on the DATAMASTER should now read 101. Enter all your addresses in this manner. This is what is happening: the address is recorded on one line of the DATAMASTER but will print out in address format. The reason is that a LF,CR is used at the end of each line which is recorded as a character. When a line ends with CR,LF it is a line delineator and will advance the line counter to the next line.

   The Control U recorded at the end of the address will automatically cause the remaining data to be skipped when the SKIP DATA key is on. This is used to address envelopes or when you do not want the salutation printed.

   At the end of the salutation a LF,LF,CR,Control A,1,CR, LF was recorded. The LF,LF,CR will cause the terminal to double space and put the print head at the left hand margin. The Control A will take the DATAMASTER back to line 1 to print out the body of the letter. The CR,LF is the line delineator and since it is recorded after the Control A the terminal will not respond.

6. After you have completed recording the number of addresses you want, end the list with Control S,CR,LF. This command will cause the DATAMASTER to stop at the end of the list.

7. Go to line 1 and record your letter, using CR,LF at the end of each line. If you want to double space between paragraphs use LF,CR,LF at the end of a line.

8. At the end of the letter, end with the sequence CR,Control L,Control A,0,CR,LF. This ending sequence will cause the print head to go to the left hand margin (CR), scroll up to the next page (Control L,-top of form command on your terminal). The DATAMASTER will "go to" line 0 where we will place a pointer. The pointer will cause the DATA-MASTER to increment the addresses one at a time: 100, 101 and so on, when the Option switch is On.

ADDRESSES:

Go to line 100.
Go into Record mode.

0100 Mr. John Smith (LF,CR)
1234 West A Street (LF,CR)
Los Angeles, CA. 92660 (LF,CR,Control U,LF)

Dear John, (LF,LF,CR,Control A,1,CR,LF)

0101 Mr. Sam Spade (LF,CR)
1831 E Street (LF,CR)
New York, New York 10017 (LF,CR,Control U, LF)

Dear Sam, (LF,LF,CR,Control A,1,CR,LF)

0102 Mr. Dale Simes (LF,CR)
24 North Road (LF,CR)
Mountain View, CA 94043 (LF,CR,Control U,LF)

Dear Dale, (LF,LF,CR,Control A,1,CR,LF)

0103 Control S,CR,LF

Go out of RECORD mode.

LETTER:

Go to line 2.
Go into RECORD mode.
0002 This is just a brief note to inform you that (LF,CR)
0003 the Auto Address feature in our DATAMASTER is working (CR,LF)
0004 great! (LF,CR,LF)

0005 (15 spaces) Sincerely, (LF,LF,LF,CR,LF)

0006 (15 spaces) Glenn Patterson (CR,Control L, Control A,Ø,CR,LF)

Go out of RECORD mode.

9. Now we are ready to execute our run.

   (A) First we need to instruct the DATAMASTER to go from line Ø to the list of addresses which were recorded beginning on line 100.

      1. Go to line Ø
      2. Put the DATAMASTER into RECORD mode.
      3. RECORD: Control A,0099,SPACE,CR/LF. The DMII will add the line number (0099) and the number of spaces (1) to determine where the addresses begin (100).
      4. Go out of RECORD mode.

   (B) Position the paper in the terminal where you want the addresses to start.

   (C) Set the top of form in the terminal. The easiest way is to push the reset botton.

   (D) Check the switch on the DATAMASTER. All switches should be OFF except the OPTION switch.

   (E) Now go to line 0 (enter 0 from the DATAMASTER 10 key pad or depress the CLEAR key). The line indicator should read 0.

   (F) Push the RUN key on the DATAMASTER.

10. How to run your envelopes or address labels.

   (A) Check all switches on the DATAMASTER. The SKIP DATA and OPTION keys should be on.

   (B) Go to line Ø and record the space you need between addresses. Example: LF,LF,LF,Control A,0099,SPACE, CR/LF will give you three (3) spaces between each address.

   (C) On line 1 record Control A,Ø,CR/LF.

   (D) Put your envelopes or labels in the printer.

   (E) Push the CLEAR button.

   (F) Push RUN.

   (G) The addresses are automatically printed.

EXAMPLE 2: Sequence Go To commands to automatically select desired data in the form of paragraphs in order to create legal contracts, lease agreements, or a document of some type. (See figure A-2)

OPERATIONAL PROCEDURE:

1. Check all switches on the DATAMASTER. Only the OPTION switch should be on.

2. Be sure the terminal is on line to the DATAMASTER and the correct Baud Rate is selected.

3. Select the line you wish to start your paragraphs on. For this demonstration, select line 100. Enter 100 from the DATAMASTER 10 key pad. 100 should be shown on the line display of the DATAMASTER.

4. Go into Record mode. (Push the Record button on the DATAMASTER.) When in Record mode, the Record button will be illuminated.

5. Now enter the paragraphs in the following manner:

```
100  General and special county and city taxes, (CR;LF)
101  if any, together with special district (CR,LF)
102  levies, if any, included and collected with (CR,LF)
103  the tax bill.  (LF,LF,CR,Control A,Ø,CR,LF).

104  Covenants, conditions, restrictions, rights, (CR,LF)
105  rights of way, easements and exceptions of (CR,LF)
106  minerals, oils, gas, water, carbons and (CR,LF)
107  hydrocarbons on or under said land, now of (CR,LF)
108  record, and in deed to file, if any, affecting (CR,LF)
109  the use and occupancy of said property.  (LF,LF,CR
     Control A, Ø, CR,LF).

110  Buyer to obtain and qualify for a new FHA (CR,LF)
111  203B loan in the amount of $32,350.00 (CR,LF)
112  payable monthly, principal and interest (CR,LF)
113  at the rate determined by lender, impounds (CR,LF)
114  for taxes and insurance in addition to (CR,LF)
115  regular monthly payments, balance of terms (CR,LF)
116  as written.  Buyers signature on lender's (CR,LF)
117  documents shall be deemed approval of such  (CR,LF)
118  terms.  (LF,LF,CR, Control A, Ø,CR,LF)
```

Enter all your paragraphs in this manner. This is what is happening; the paragraph is recorded on lines 100 through 103. The ending sequence (LF,LF,CR,Control A, Ø,CR,LF) will cause the following to happen: LF,LF,CR creates a double space between paragraphs and puts the print head on the left hand margin. Control A, Ø makes the DATAMASTER "Go To" line Ø where we will create a pointer instructing the DATAMASTER to print the next paragraph selected.

6. After you have recorded all of the paragraphs, do the following:

   (A) Take the DATAMASTER out of Record mode. (Push the Record button.)

(B) Select the paragraph you want to print by line numbers:

Paragraph 1 - Line 100
Paragraph 3 - Line 110
etc.

(C) Go to line Ø and set your pointer:

1. Go to line Ø.
2. Put the DATAMASTER into Record mode.
3. Record Control A, ØØØØ,SP,CR,LF. This instruction causes the DATAMASTER to go to line 1, do the instruction on line 1, then go to line 2 and do the instruction on line 2 and so on.
4. On line 1 record Control A, 110, CR,LF. This instructs the DATAMASTER to go to line 110, print what is recorded there until it reaches a Control A, Ø, which will bring it back to the pointer for the next instruction.
5. On line 2 record Control A, 100, CR,LF. This instruction causes the DATAMASTER to go to line 100 and print what is recorded there which in this case is paragraph 1. At the end of paragraph 1 the DATAMASTER will go back to line Ø for the next instruction.
6. On line 3 record Control A, 104,CR,LF. This instruction causes the DATAMASTER to go to line 104 and print paragraph 2. The DATAMASTER will then go back to line Ø for the next instruction.
7. On line 4 record Control S,CR,CF. This is a stop code.
8. Go out of record mode.

(D) Check the switches on the DATAMASTER. Put the Option switch on, and all other switches off.

(E) Go to line Ø.

(F) You should have printed out paragraphs 3,1 and 2 in that order and the DATAMASTER should have stopped printing.

The AUTO ADDRESS option gives the DATAMASTER II virtually unlimited capabilities and should be studied thoroughly in order to take advantage of its benefits.

Figure A-1

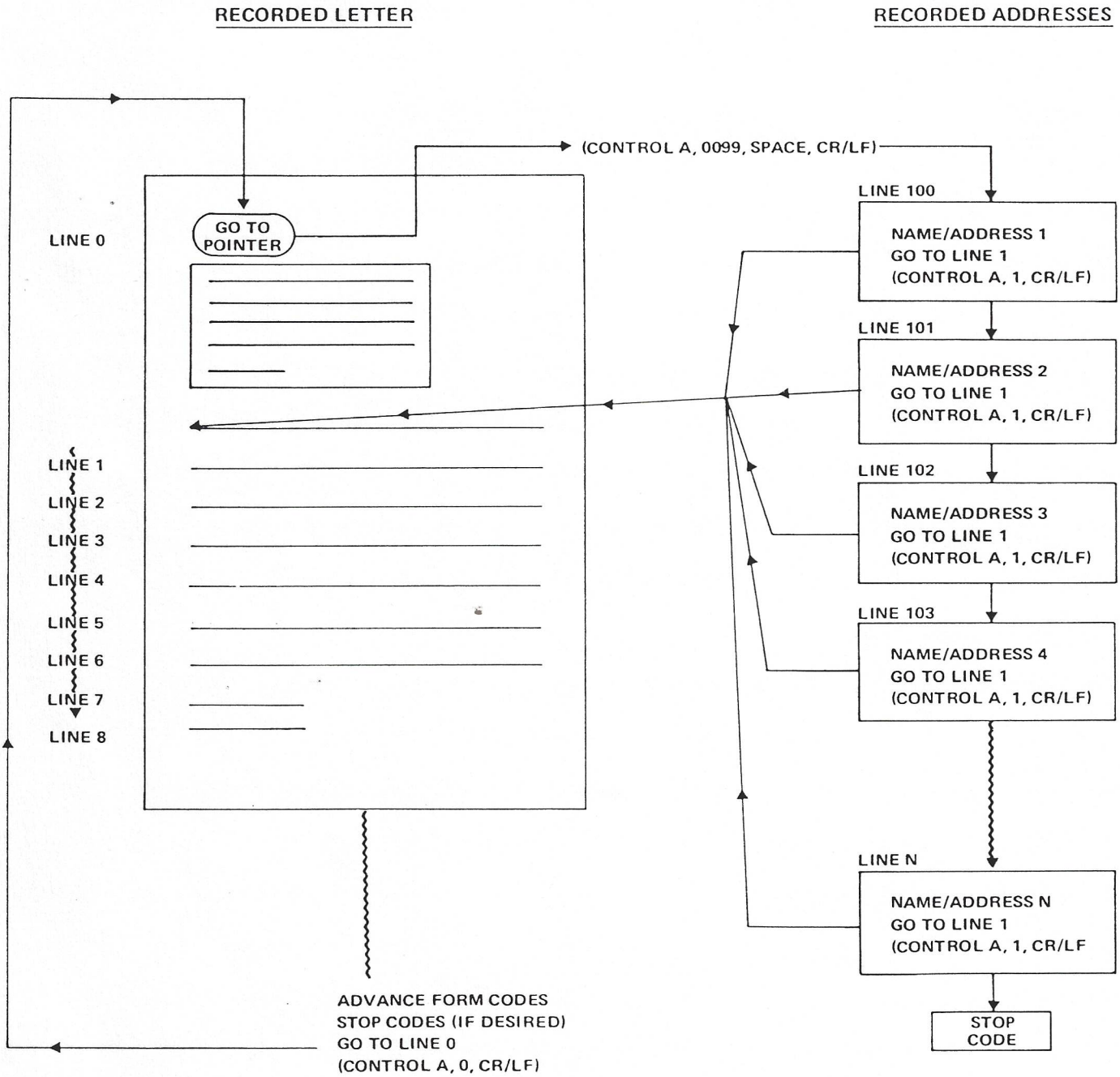
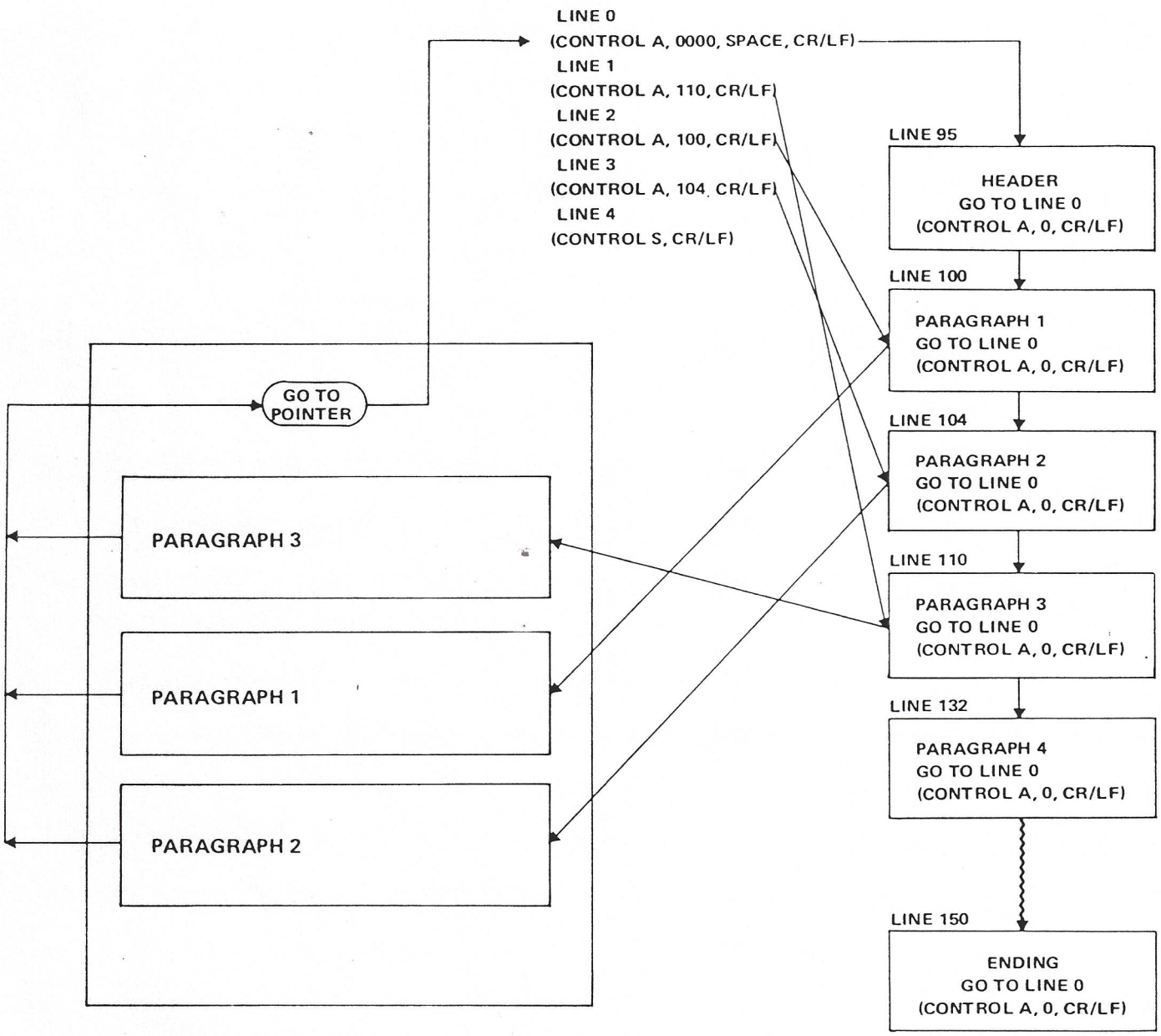

RECORDED LETTER
RECORDED ADDRESSES
(CONTROL A, 0099, SPACE, CR/LF)
LINE 0
GO TO POINTER
LINE 1
LINE 2
LINE 3
LINE 4
LINE 5
LINE 6
LINE 7
LINE 8
LINE 100
NAME/ADDRESS 1
GO TO LINE 1
(CONTROL A, 1, CR/LF)
LINE 101
NAME/ADDRESS 2
GO TO LINE 1
(CONTROL A, 1, CR/LF)
LINE 102
NAME/ADDRESS 3
GO TO LINE 1
(CONTROL A, 1, CR/LF)
LINE 103
NAME/ADDRESS 4
GO TO LINE 1
(CONTROL A, 1, CR/LF)
LINE N
NAME/ADDRESS N
GO TO LINE 1
(CONTROL A, 1, CR/LF
STOP CODE
ADVANCE FORM CODES
STOP CODES (IF DESIRED)
GO TO LINE 0
(CONTROL A, 0, CR/LF)

Figure A-2


LINE 0
(CONTROL A, 0000, SPACE, CR/LF)
LINE 1
(CONTROL A, 110, CR/LF)
LINE 2
(CONTROL A, 100, CR/LF)
LINE 3
(CONTROL A, 104, CR/LF)
LINE 4
(CONTROL S, CR/LF)
GO TO POINTER
PARAGRAPH 3
PARAGRAPH 1
PARAGRAPH 2
LINE 95
HEADER
GO TO LINE 0
(CONTROL A, 0, CR/LF)
LINE 100
PARAGRAPH 1
GO TO LINE 0
(CONTROL A, 0, CR/LF)
LINE 104
PARAGRAPH 2
GO TO LINE 0
(CONTROL A, 0, CR/LF)
LINE 110
PARAGRAPH 3
GO TO LINE 0
(CONTROL A, 0, CR/LF)
LINE 132
PARAGRAPH 4
GO TO LINE 0
(CONTROL A, 0, CR/LF)
LINE 150
ENDING
GO TO LINE 0
(CONTROL A, 0, CR/LF)

APPENDIX B

SPECIAL FUNCTION ASCII CODES

FUNCTION	CODE*	ACTION
RUN	DC1 (+Q)	Initiates a disk Read.
LINE	CAN (+X)	Releases one line of data.
WORD	ETB (+W)	Releases one word (characters between spaces).
CHAR	ETX (+C)	Releases one character.
RECORD ON	DC2 (+R)	Sets DATAMASTER into RECORD mode.
RECORD OFF	DC4 (+T)	Takes DATAMASTER out of RECORD mode.
STOP	DC3 (+S)	Halts Read Operation.
CLEAR	Break	Halts Read Operation, clears DATAMASTER when in an overflow condition.
RECORDABLE STOPS	DC3 (+S)	Halts Read Operation, sends DC3.
	EOT (+D)	Halts Read Operation, sends EOT.
	EM (+Y)	Halts Read Operation, no character sent.
SEARCH	STX (+B)	Places DATAMASTER into Search Mode. Enter data to be searched. A RUBOUT (DEL) code or a PLAY key initiates the search.
INSERT	SO (+N)	Places DATAMASTER into RECORD and allows data to be inserted in an existing line of data.
"GO TO"	SOH (+A)	Places DATAMASTER into the ACCESS mode. The line number followed by a CR/LF and either a RECORD or PLAY key initiates the "GO TO."

FUNCTION	CODE*	ACTION
LINE TERMINATOR	CR/LF	Initiates a disk write when in the RECORD mode. Inhibited when in the PACK mode. CR or LF may be used as line terminator. (Field Changeable, see Appendix E.)

*The Control Codes for the special functions are ROM programmable. Any function can be controlled by mixing or substituting Control Codes as listed in the Optional Control Code Chart. Contact Western Telematic or an authorized representative for cost and availability.

ASCII CONTROL CODES

CODE	CNTRL	CODE	CNTRL
*SOH	A	*DC1	Q
*STX	B	*DC2	R
*ETX	C	*DC3	S
*EOT	D	*DC4	T
ENQ	E	NAK	U
ACK	F	SYN	V
BELL	G	*ETB	W
*BS	H	*CAN	X
HT	I	*EM	Y
*LF	J	SUB	Z
YT	K	ESC	[
FF	L	FS	\
*CR	M	GS	]
*SO	N	RS	^
SI	O	US	-
DLE	P		

*The ASCII Control Codes in the chart are currently used in the standard configuration.

CODE- ASCII.

START BIT- 1 Bit.

DATA- 7 Bit (128 Characters).

PARITY- EVEN. DMII accepts EVEN, ODD or No Parity. However, EVEN Parity is always transmitted.

STOP BITS- 2 when 110 Baud is selected, 1 with all other Baud rates.

b7 → b6 → b5 → / Bits / b4 ↓	b3 ↓	b2 ↓	b1 ↓	COLUMN → / ROW ↓	0 0 0	0 0 1	0 1 0	0 1 1	1 0 0	1 0 1	1 1 0	1 1 1
					0	1	2	3	4	5	6	7
0	0	0	0	0	NUL	DLE	SP	0	@	P	`	p
0	0	0	1	1	SOH	DC1	!	1	A	Q	a	q
0	0	1	0	2	STX	DC2	"	2	B	R	b	r
0	0	1	1	3	ETX	DC3	#	3	C	S	c	s
0	1	0	0	4	EOT	DC4	$	4	D	T	d	t
0	1	0	1	5	ENQ	NAK	%	5	E	U	e	u
0	1	1	0	6	ACK	SYN	&	6	F	V	f	v
0	1	1	1	7	BEL	ETB	'	7	G	W	g	w
1	0	0	0	8	BS	CAN	(	8	H	X	h	x
1	0	0	1	9	HT	EM	)	9	I	Y	i	y
1	0	1	0	10	LF	SUB	*	:	J	Z	j	z
1	0	1	1	11	VT	ESC	+	;	K	[	k	{
1	1	0	0	12	FF	FS	,	<	L	\	l	|
1	1	0	1	13	CR	GS	-	=	M	]	m	}
1	1	1	0	14	SO	RS	.	>	N	^	n	~
1	1	1	1	15	SI	US	/	?	O	_	o	DEL

APPENDIX C

CONTROLS AND INDICATORS

AC POWER AND STANDBY

POWER ON	Applies AC Power to the DM II. The POWER ON indicator will illuminate and the fan should operate. Power should remain on when connected between the data terminal and modem to allow data signals to pass through the DM II. Always press CLEAR after turning POWER ON. The DM II should not be powered down while the disk is loaded.
STANDBY	Turns off the disk drive motor, holds the DM II in reset and allows the unit to be transparent as data passes between the data terminal and modem.

PUSHBUTTONS/KEYS

CLEAR	Resets the line counter to zero and clears the editing buffer.
RECORD	The unit is placed in RECORD mode by pressing the RECORD key and turning on the light. The unit is taken out of the RECORD mode by pressing the RECORD key and turning out the light. From the terminal keyboard or remote processor a DC2 (+R) sets the DM II into RECORD, and a DC4 (+T) takes the DM II out of RECORD. A SO (+N) places the DM II into RECORD and allows data to be inserted in an existing line. If the disk is write protected the WRITE PROTECT light will be on and DM II will not go into RECORD mode.
10-KEY PAD	User enters the line number desired. It is not necessary to enter preceding zeros (i.e., Line 0012, enter 12).
LAST	Decrements the line counter by one.
NEXT	Increments the line counter by one.
RUN	Pressing of the RUN key causes the DM II to access the data found in the location indicated by the line counter and transmit until either a STOP CODE is detected or manual

intervention from the LINE, WORD or CHAR key occurs. From the terminal keyboard or Remote Processor a DC1 (+Q) initiates the RUN mode. Manual intervention from the keyboard is

LINE	CAN (+X)
WORD	ETB (+W)
CHAR	ETX (+C)

LINE — Pressing the LINE key causes the DM II to release recorded data between CR/LF codes to the terminal. From the terminal keyboard or Remote Processor a CAN (+X) initiates the LINE mode.

WORD — Pressing the WORD key causes the DM II to release a single word (data between spaces) to the terminal. From the terminal keyboard or Remote Processor a ETB (+W) initiates the WORD mode.

CHAR — Pressing the CHAR key causes the DM II to release a single character to the terminal. From the terminal keyboard or Remote Processor a ETX (+C) initiates the CHAR mode.

ROCKER SWITCHES

ON LINE — When selected, allows the DM II to send and receive data from the data set. When not selected the DM II is in local mode and the Receive and Send Data Lines to the DATASET are inhibited but control lines to the DATASET are not dropped, which allows the user to switch to LOCAL and do editing while remaining connected to the computer. When selected, the ON LINE indicator light will illuminate.

NO PRINT — Suppress local print-out. Normal transmission occurs to the CPU. Normally used when the system is in full duplex or "Echoplex" mode.

PRINT ID — When selected, the line number will be displayed at the beginning of each line. Lines that contain the Control A (+A) "GO TO" code will be displayed. When in the RECORD mode, the line number of the next line will be displayed.

* SKIP DATA	When selected, causes those lines preceded by a Control U code to be skipped on play-back up to the CR/LF code. Data after the skip code (Control U) such as STOPS, GOTO, etc. will still perform their function but will not be sent to the terminal or computer.
* AUTO LINE FEED	In the Local mode the Auto LF key changes the line termination code from CR/LF to CR. The DM II automatically issues the LF character to the terminal when recording and playing data. Any characters after the CR are stripped from the data. In the ON LINE mode the Auto LF key sets the DM II into the Interactive or line at a time mode. The DM II will automatically stop after each CR and wait for the line feed from the computer. An X-ON received from the computer will release the next line of data. When recording data from the computer turn the Auto LF key OFF so the CR/LF will terminate the line. When sending this data back to the computer turn the Auto LF Switch ON which will cause data up to the CR to be transmitted. The LF will be stripped out.
TRANSPARENT	When selected, allows the DM II to be transparent to all codes except carriage return (CR), line feed (LF) and the EM (+Y) stop code. The EM (+Y) stop code provides a means to end a READ while in the TRANSPARENT mode. This allows all characters to be recorded and inhibits the DM II from reacting to all control codes except EM (+Y). The TRANSPARENT mode causes a backspace to be an underscore.
PACK	When selected, inhibits the DM II from advancing line numbers when a CR/LF is received. The line will advance when the buffer has received 128 characters. This feature allows the utilization of all memory positions for efficient data storage and therefore does not allow extra positions for line expansion when editing.
OPTION	When selected, this switch activates the Multi-Search and Auto Address Options. SEE APPENDIX A FOR DETAILS.

* NOT AVAILABLE ON DUAL DRIVE MODEL.

INDICATOR LIGHTS

ON LINE	Indicates that the ON LINE switch is selected.
RX DATA	Monitors incoming data from both terminal and modem.
NO PRINT	Indicates when the NO PRINT switch is selected.
READ CHECK	Indicates a recording error on the disk, an unused location or an unrecordable sector on the disk cartridge. The DM II will re-read a location 40 times before indicating an error. Pressing the RUN key will initiate another 40 re-reads. To skip over an error location, press NEXT to advance 1 line and press RUN. Check the disk for damage.
WRITE PROTECT	Indicates that the loaded disk is write protected, and inhibits the DM II from going into RECORD mode.
OVERFLOW	Indicates that the DM II is commanded to access a record greater than 2431. When in OVERFLOW condition, pressing CLEAR on the DM II or pressing the BREAK key on the terminal keyboard will reset the DM II to zero.
DISK READY	Indicates that the disk cartridge is properly installed and ready for use.

BACKPANEL SWITCHES

DATA RATE	Allows for selection of two predetermined band rates. (Refer to Appendix E, Baud Rate Selection.)
CR DELAY	Allows a delay of 360 milliseconds after each carriage return.

APPENDIX D

TROUBLE CHECKLIST

1. POWER ON button will not light.

   - Make sure the DM II power plug is plugged in.

2. Disk loaded but DISK READY light will not come on.

   - Disk is not correctly loaded, or may be upside down.
   - Check drive belt on disk drive (See Appendix H).

3. Control functions on the data terminal will not make the DMII react.

   - Data Rate/Baud Rate switch on the DM II set different than the terminal.
   - Data terminal must be in the ON-LINE mode. This is not the ON-LINE mode for the DM II.
   - Turn TRANSPARENT switch Off.

4. Keyboard functions from either the DM II or the data terminal cause unpredictable results.

   - Data Rate/Baud Rate switch on the DM II or data terminal not set for the same baud rate.

5. RECORD light will not go on.

   - Is Disk Write protected?

6. Garbage printed on terminal.

   - Check Baud Rates.
   - Check for HALF or FULL DUPLEX - (no print switch).
   - ON-LINE switch ON, but not connected to the computer. (Noise generated by the coupler or modem will cause erroneous data).

7. The digit 3 is displayed in left side of LINE NUMBER.

   - Logic board not properly seated.

8. No keys work on keyboard, RECORD, LAST, NEXT, etc.

   - Check DISK READY.

APPENDIX E

INSTALLATION

CONNECTIONS AND SET-UP

1. After unpacking, check unit for obvious physical damage and report to shipper.

2. Place unit to allow free air circulation around base of the unit. The power cord should be plugged into a grounded power outlet. Do not use adapters which would prevent the unit from being properly grounded.

3. Disconnect the data terminal from its modem by disconnecting the 25-pin EIA (Male) connector which then mates to the 25-pin EIA (Female) plug on the DATAMASTER marked "Terminal." If connecting in this manner poses a problem check with terminal manufacturer to verify RS232 compatibility.

4. To the connector marked "Modem" connect the appropriate end of the WTI supplied dataset cable. The other end (25-pin male) connects into the corresponding connector of the modem. The DATAMASTER should now be connected in series* between the data terminal and the modem as shown in Figure 3.

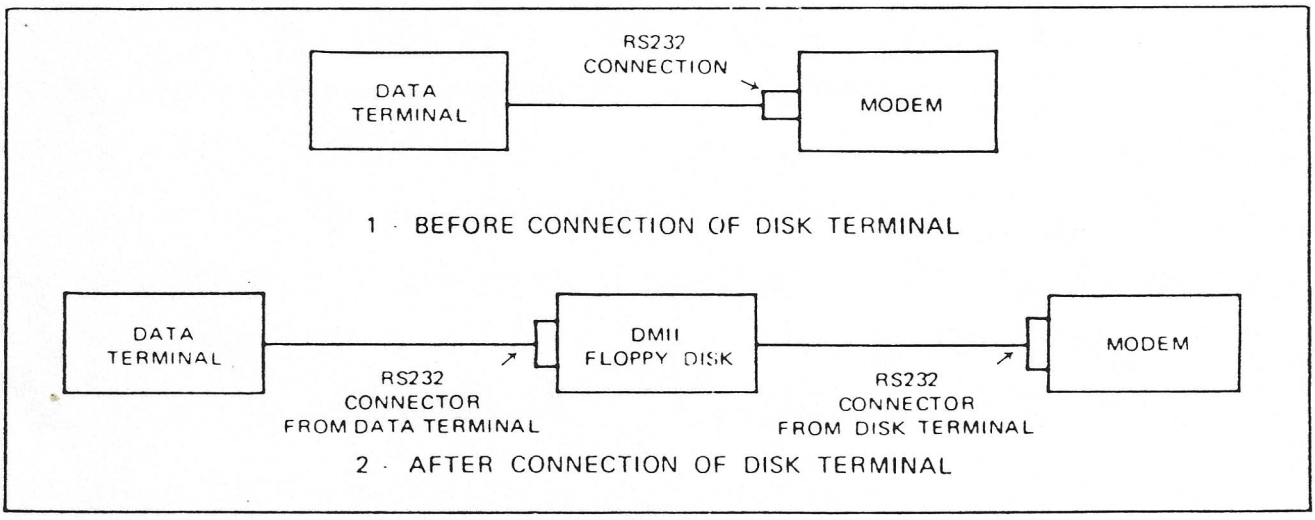


FIGURE 1 DISK CONNECTION

*NOTE: When the disk is not in use it is necessary to leave "AC POWER" and "STANDBY" ON to allow data signals to pass between the data terminal and modem. The data terminal should be in the "ON LINE" mode since the disk can now receive and send data to the data terminal without actually being "ON LINE" to a CPU.

5. Set the DATA RATE switch to correspond to the baud rate of the data terminal.

BAUD RATE SELECTION

The DATA RATE switch located on the rear panel of the DM II has positions marked HI and LOW for selecting two baud rates. The DM II DATA RATES are preset at the factory to:

HI = 1200 Baud

LOW = 300 Baud

A jumper switch is provided on the logic board for changing baud rates.

BAUD RATE	HI/LOW SWITCH	JUMPER (CLOSED)
110	Low	L8-4&8
300	Low	L8-3
600	Low	L8-1
1200	Low	L8-2
300	Hi	L8-7
1200	Hi	L8-6
2400	Hi	L8-5

Examples of settings:

Low 300 Baud = L8-3 Closed

Hi 1200 Baud = L8-6 Closed

TERMINATION CODE SELECTION

LINE TERMINATION CODE	INHIBIT RECORDING OF
CR	NUL
CR/LF	DEL
LF	

A jumper is provided on the logic board to select the inhibit or line termination code.

APPENDIX F

INTERFACE REQUIREMENTS

The DATAMASTER II attaches to any asynchronous ASCII printer or CRT terminal using the external RS232 connectors. Figure 1, Appendix E, shows a block diagram of the DM II in relationship to the data terminal and modem.

A dataset cable (10 feet long), terminated at one end with a twenty-five (25) pin, male connector in accordance with this standard is provided with the DM II.

The following circuits are used:

Pin Number	Circuit	Description
1	AA	Protective Ground
2	BA	Transmitted Data
3	BB	Received Data
*4	CA	Request to Send
5	CB	Clear to Send
6	CC	DataSet Ready
7	AB	Signal Ground
8	CF	Received Line Signal Detector
*11	SCA	Secondary Transmitted Data
*12	SCF	Secondary Received Line Signal Detector
*20	CD	Data Terminal Ready
*22	CE	Ring Indicator

*Straight through connection. Not connected to DM II electronics.

APPENDIX G

COMMUNICATIONS

There are two modes in which data can be transmitted to the computer, Batch and Interactive mode.

BATCH MODE

Batch mode means data will be transmitted from the DMII without interruption until either a Stop Code is detected or manual intervention occurs. The computer must not attempt to send back any data during this time or unspecified results will occur. Various software systems provide a means to receive continuous data. This may be called "Tape Mode", "Batch Mode", "Data Entry Mode" etc. In this mode all error messages, line feeds, etc., are not transmitted from the computer.

INTERACTIVE (Line at a Time)

Many systems detect the carriage return as the end of line signal and answer back with a line feed, followed by an X-ON. This can be determined by simply noting how the terminal reacts when on-line with the computer. When pressing CR does a line feed come back? If the DM II is out of standby with the transparent switch off, does the DM II release data when the carriage return is pushed? If both answers are yes, then the system reacts on carriage return and sends the X-ON code. Some systems use different "Hand Shaking" protocalls. Bowne Timesharing sends only a line feed, IBM-TSO sends an X-ON followed by an X-OFF.
It must be determined what protocall is used before the Datamaster can successfully interact with the computer.

STANDARD INTERACTIVE ON THE DMII

The Interactive mode is entered when the Auto LF switch is On and the DM,II is on line to the computer. This mode causes the Datamaster to stop after each carriage return. The line feed character will be stripped out. The DM II will wait until an X-ON character is received.

Turn OFF the Auto LF switch when recording data from the computer to capture the line feed character so the paper will advance when playing back in the local mode.

Keep the DMII in standby or transparent until you are ready to send or record data. This prevents a false start if X-ONs are always sent with each line.

Some systems send long bursts of "Del" characters which would record on the DMII. It may be necessary to ignore them, which would speed up playback. To INHIBIT the recording of Del characters install the jumper on the PC board.

Tips on Communications

1. Make sure a STOP CODE is recorded at the end of the text.

2. Stay in either STAND-BY, or TRANSPARENT before entering or recording data to prevent the DM II from sending data before it is ready.

3. After recording data, switch out of ON-LINE mode and record an X-OFF (+S) to end the text.

4. If double characters occur switch to the NO-PRINT mode. Check terminal and modem for proper duplex.

5. Consult with Western Telematic Inc., customer service if you have questions concerning Interactive Mode.

HALF/FULL DUPLEX

Computer systems operate in either Half or Full Duplex. Echoplex is another name for full duplex.

Full duplex means that when a key is depressed on the terminal keyboard that character is sent over the communication line and received by the computer which then echoes it back to be displayed or printed on the terminal.

Half duplex means the terminal locally causes the character to print and if a character was simultaneously sent from the computer, two characters or garbage would print.

When the DM II is in the ON-LINE mode data is transmitted to the terminal and the computer at the same time. If the computer were in full duplex and echoed back characters, then the terminal would receive a character from the DM II as well as the computer which would cause double characters or garbage to print. If this occurs it will be necessary to use the NO-PRINT switch which allows data to be sent to the computer only.

COMMUNICATION SWITCHES

The ON-LINE or STAND-BY switch allows data to pass through the DM II to the modem.

The ON-LINE switch forces the "Clear to Send" and "Carrier Detect" signals to the terminal High. With the switch off the circuits will follow the inputs of the modem.

The NO-PRINT switch (Full Duplex) inhibits disk data from being transferred to the printing terminal. Data from the printing terminal to the disk is also blocked. This allows data to be transmitted to the computer then echoed back to the terminal to be printed.

PROGRAM CONSIDERATIONS

The ASCII codes that control the functions of the DataMaster II are found in Appendix B.

Computer control of the DM II during two specific functions required that a delay be programmed to assure that:

1. The disk has fully rotated.
2. The head has had time to complete its move.
3. The buffer has been processed.

The two operations requiring a delay are:

1. A line access followed by going into Record mode.
2. Going out of Record mode.

BAUD	HEAD MOVEMENT "DEL"codes issued for delay	OUT OF RECORD "DEL" codes issued for delay
300	14	6
1200	56	21
2400	110	42

NOTE: Disk rotation requires 170ms, head movement from Line Ø to Line 2431 requires 500 ms.

BATCH MODE EXAMPLES

To Record data starting at line 1500, in 300 Baud.

1.	SOH,1500	"GO TO" line 1500.
2.	DC2	Place DM II in Record Mode.
3.	14 DEL Codes	14 DEL Codes issued for delay.
4.	Send Data	Transmit data for recording.
5.	DC3 CR/LF	Record a Stop Code and Carriage Return, Line Feed.
6.	6 DEL Codes	6 DEL Codes issued for delay, empty buffer.
7.	DC4	Turn OFF Record.

To begin Search from Line 100 at 300 Baud and when variable is found, start Reading.

1.	SOH,100	"GO TO" line 100.
2.	DC2	Place DM II in Record Mode.
3.	14 DEL Codes	14 DEL Codes issued for delay.
4.	DC4	Turn OFF Record. (This routine sets the head to position 100.)
5.	STX variable DEL	Submit the data to be searched for followed by DEL to start the search.
6.	DC1 CR/LF	Start reading when the searched for variable is found.

APPENDIX H

SPECIFICATIONS

FILE CAPACITY	311,168 characters maximum organized as 2,431 addressable lines of 128 characters.
FILE FORMAT	Maximum 128 characters per block; CR/LF* terminates line and advances line counter. PACK mode or absence of CR/LF automatically links to the next line on the 128th character.
	*CR or LF optional, field changeable.
ACCESS TIME	0.4 seconds average from keyboard or CPU to any line; Max. 0.8 seconds.
DISK DRIVE	Shugart Model 801R. Designed for long life and reliability. Features include: cast aluminum deck, ceramic head, tunnel erase, write protect and a centering cone for positive disk positioning.
DISK CARTRIDGE	Use WTI Number DC2 or equivalent flexible disk. Specify non-initialized IBM style with hard sector and index holes in center. Double sided cartridge (flippy) may be used.
TERMINALS	Any ASCII coded asynchronous printer or display with external RS232 connector.
DATA RATES	110, 300, 600, 1200, 2400 Baud. (Baud rates up to 9,600 optional.)
ATTACHMENT INTERFACE	External RS232 connectors between existing printer/display terminal and Dataset (10 feet cable supplied).
DATASETS (MODEMS)	103/113 & 202 types. Full or half-duplex and acoustic equivalents.

FILE PROTECT	Write protected disk inhibits record.
SIZE	22.5" Long x 13.5" Wide x 8" High
WEIGHT	35 pounds net, 45 pounds shipping
POWER	117 vac ± 10%, 60 Hz

DISK CARTRIDGE

Use WTI approved flexible disk number DC2 or equivalent. (Specify IBM Type non-initialized with hard sector and index holes in center.) Double sided cartridge may be used. The cartridge is 8.00 x 8.00 x .06 inches. The disk is exposed through four openings in the cartridge. The center circular opening is for loading, where a rotating hub can grip the disk, causing it to rotate within the cartridge. When the cartridge is loaded, the Read/Write head is positioned over the elongated opening. The upper smaller hole is used to sense index and sector pulses. If the disk is Write Protected (Read Only), there will be a hole in the lower corner. To permit writing this hole must be covered.

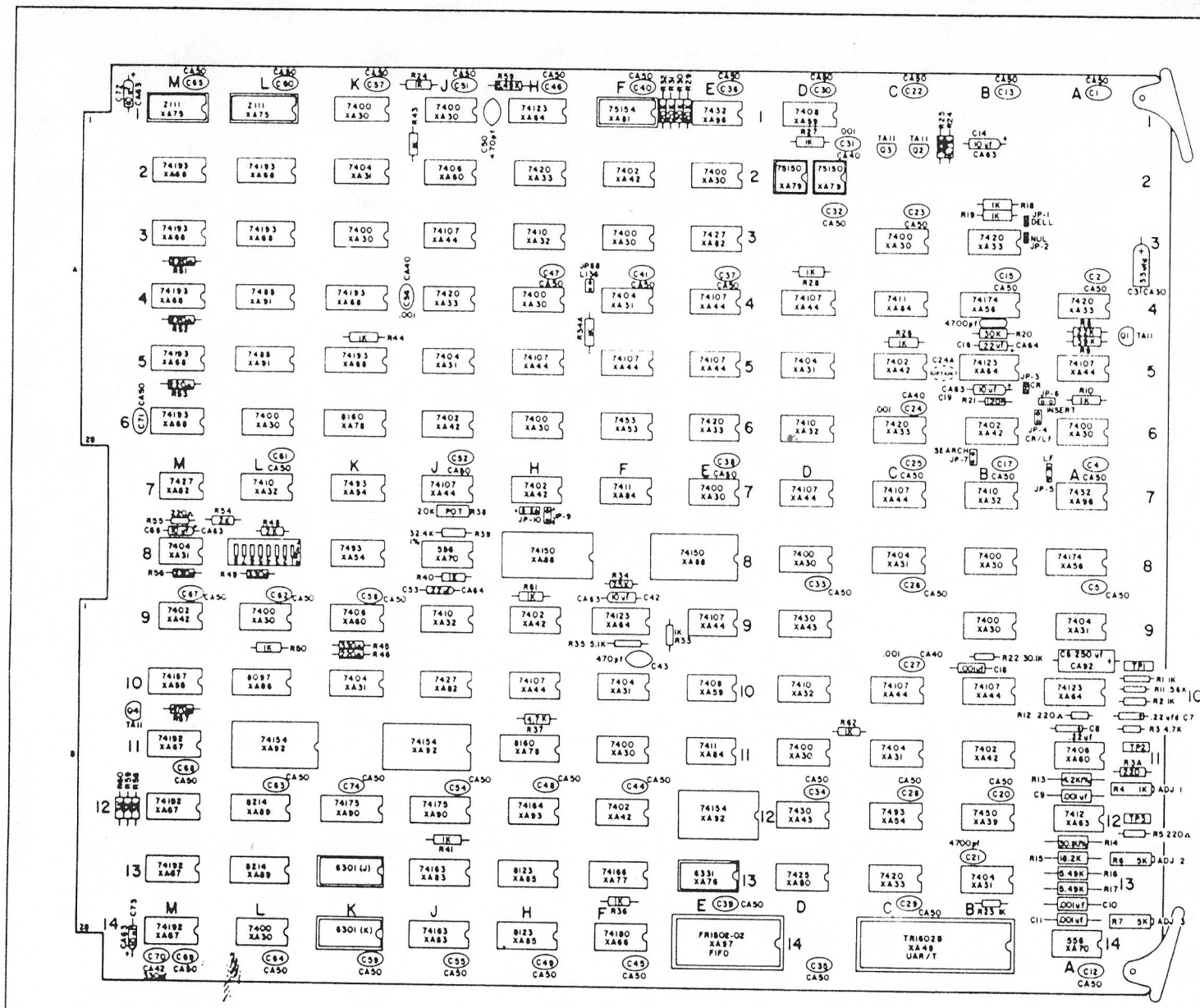


TABLE I - OPTION JUMPERS

JUMPER	FUNCTION WHEN SHORTED	FACTORY SET
JP-1	INHIBITS RECORDING OF "DELL" CHAR	OPEN
JP-2	INHIBITS RECORDING OF "NUL" CHAR	OPEN
JP-3	"CR" AS LINE TERMINATION	OPEN
JP-4	"CR/LF" AS LINE TERMINATION	SHORT
JP-5	"LF" AS LINE TERMINATION	OPEN
JP-6	INHIBITS INSERT FEATURE	OPEN
JP-7	INHIBITS SEARCH FEATURE	OPEN
JP-8	INCREASES LINE LENGTH TO 136	OPEN
JP 9,10	ALLOWS BREAK TO RESET ON OVERFLOW	SHORT

TABLE II - CLOCK ADJUSTMENTS

ADJ	FUNCTION	KHZ	TEST POINT
1	MASTER CLOCK	500 ±1%	TP3
2	HIGH CLOCK (150)	38.4 ±.06%	TP2
3	LOW CLOCK (110)	28.16 ±.06%	TP2
4	DISK STEP	7 ± 1/2 MSEC	TP1

TABLE III - BAUD RATE SELECTION

RATE	HI/LOW SWITCH	JUMPER (CLOSED)
110	LOW	L8-4 8 6
300	LOW	L8-3
600	LOW	L8-1
1200	LOW	L8-2
300	HI	L8-7
1200	HI	L8-6
2400	HI	L8-5

REF DESIG	PART NUMBER	DESCRIPTION

BILL OF MATERIAL

wti
western telematic, inc.
5317 Fair Road • Alhambra • [illegible]

TITLE
LOGIC BOARD
DM II

DRAWN
DATE 10-6-75
CHECKED
DATE
NEXT ASSEMBLY

DRAWING NUMBER
A11460